

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED
CENTRAL FAX CENTER
MAR 19 2007

C. Amendments to the Claims.

1. (Previously Presented) A data processing apparatus that arbitrates sharing of a single semiconductor memory circuit among multiple data processing circuits, comprising:

5 a semiconductor memory circuit that executes operations corresponding to a command signal, address signal and clock signal received external to the semiconductor memory circuit, the semiconductor memory circuit includes a clock enable signal input, and a chip select signal input; and

10 a data processing circuit that supplies the semiconductor memory circuit with a first clock enable signal output to the clock enable signal input for enabling an input of the clock signal when active and disabling the input of the clock signal when inactive, and a first chip select signal output to the chip select signal input for enabling input of command signals when the chip select signal is active and disabling input of command signals when the chip select signal is inactive; wherein

15 before the data processing circuit ends control of the semiconductor memory circuit and stops supplying the first clock enable signal output and first chip select signal output, a different data processing circuit starting control of the semiconductor memory circuit supplies the semiconductor memory circuit with a second clock enable signal output to the clock enable signal input and a second chip enable signal output to the chip enable signal input, the second clock enable signal output and the second chip enable signal output having clock enable signal and chip select signal logic values at the same state as the first clock enable signal output and the first chip enable signal output provided by the data processing circuit ending control of the semiconductor memory circuit.

2. (Previously Presented) The data processing apparatus of claim 1, wherein:

30 the data processing circuit supplies a sharing arbitration circuit with a request when requesting control of the semiconductor memory

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

circuit, controls the semiconductor memory circuit in response to a grant signal, and supplies the arbitration circuit with a busy signal while controlling the semiconductor memory circuit;

when ending control of the semiconductor memory circuit, the data processing circuit stops supplying the first clock enable signal output and first chip select signal output a predetermined time after stopping the supply of the busy signal; and

the sharing arbitration circuit generates the grant signal in response the request signal before the predetermined time has elapsed.

10 3. (Original) The data processing apparatus of claim 1, wherein:

the semiconductor memory circuit enters a lower power state when the clock enable signal is inactive, as compared to when the clock enable signal is active.

4. (Previously Presented) The data processing apparatus of claim 1, wherein:

15 one of the multiple data processing circuits is a master device while any others are slave devices; and

the master device supplies the clock enable signal output and chip select signal output to the semiconductor memory circuit when none of the slave devices provides the clock enable signal output and chip select signal output to the semiconductor memory circuit.

20

5. (Original) The data processing apparatus of claim 1, wherein:

the multiple data processing circuits are connected to one another but formed independently of one another.

25 6. (Original) The data processing apparatus of claim 2, wherein:

one of the multiple data processing circuits is a master device while any others are slave devices; and

the sharing arbitration circuit is built into the master device.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

7. (Original) The data processing apparatus of claim 1, wherein:

each of the data processing circuits of the multiple data processing circuits includes a built in sharing arbitration circuit;

the multiple data processing circuits are initialized to establish one data processing circuit as a master device and all others as slave devices;
5 and

the arbitration circuit of the master device is enabled and the arbitration circuits of the slave devices are disabled.

8. (Original) The data processing apparatus of claim 7, wherein:

10 in an initialization operation, the sharing arbitration circuit built into the master device supplies at least one slave device with a grant signal; and

the at least one slave device supplies a request signal of a predetermined time period if the grant signal is received while the slave device is not supplying its own request signal; wherein
15

the sharing arbitration circuit built into the master device stops supplying the grant signal once the startup of the at least one slave device is confirmed by input of the request signal from the at least one slave device.

20 9. (Currently Amended) A data processing apparatus, comprising:

a semiconductor memory circuit that is controlled by control signal inputs to at least one control input;

at least one control line coupled to the at least one control input of the semiconductor memory circuit; and

25 a plurality of data processing circuits that share access to the semiconductor memory circuit, each data processing circuit having a control output coupled to the at least one control line; wherein

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

when one data processing circuit ends control of the semiconductor memory circuit, the data processing circuit provides a control signal at the control output at a predetermined potential for a first time period before ending the control signal; and

5 subsequently, when another data processing circuit starts control of the semiconductor memory circuit, the another data processing circuit provides a control signal at its control output at the predetermined potential within the first time period

10 wherein each of the plurality of data processing circuits includes

a request input/output (I/O) for indicating when the data processing circuit seeks control of the semiconductor memory circuit,

15 a grant I/O for indicating when the data processing circuit is granted control of the semiconductor memory circuit,

a busy I/O for indicating when the data processing circuit is controlling the semiconductor memory circuit,

20 a first switch for selectively connecting the request I/O, grant I/O, and busy I/O to a requesting circuit that generates a request indication and busy indication for the data processing circuit, and

a second switch for selectively connecting the request I/O, grant I/O, and busy I/O to an arbitration circuit that generates a grant indication; wherein

25 the first switch is disabled and the second switch is enabled when the data processing circuit is initialized as a master device, and the first switch is enabled and the second switch is disabled when the data processing circuit is initialized as a slave device.

10. (Original) The data processing apparatus of claim 9, wherein:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

the semiconductor memory circuit operates in synchronism with a clock signal, and the at least one control input includes

a chip select input that enables the processing of commands by the semiconductor memory circuit, and

5 a clock enable signal that enables generation of timing signals within the semiconductor memory circuit.

~~11. (Cancelled)~~

~~12. (Cancelled)~~

10

11

~~13. (Currently Amended)~~ The data processing apparatus of claim ~~12~~ 9, wherein:
each data processing circuit includes

a controller that generates at least one controller signal for enabling or disabling the first switch and second switch according
15 to initialization data.

12

~~14. (Original)~~ The data processing apparatus of claim 9, wherein:

the at least one control line is directly connected to the control input of the semiconductor memory circuit and the control output of each of the plurality of data processing circuits.

20 ~~15. (Cancelled)~~

~~16. (Cancelled)~~

~~17. (Cancelled)~~

~~18. (Cancelled)~~

25

~~19. (Cancelled)~~

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

20. (Cancelled)

5